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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,202	04/11/2001	Jameel Menashi	01023	1699

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EXAMINER	
ALEJANDRO, RAYMOND	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/833,202	MENASHI, JAMEEL	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *2,9,11-13,15 and 16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-8,10,14 and 17-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This paper is submitted in full response to the request for reconsideration dated 11/03/05. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn. Prosecution on the merits of this application is reopened on claims 1, 3-8, 10, 14 and 17-25 considered unpatentable for the reasons indicated below. In this regard, applicant has overcome the 35 USC 103 rejection. Refer to the abovementioned reconsideration for substance of applicant's rebuttal arguments. However, the instant claims are again rejected over a new ground of rejection as well as newly discovered art as seen infra. Thus, this application is being non-finally rejected.

Election/Restrictions

1. This application contains claims 2, 9, 11-13 and 15-16 drawn to an invention nonelected with traverse in Paper No. 03/03/03. A complete reply to this rejection must include cancellation of nonelected claims or other appropriate action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 17-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 17 recites the limitation "*said active layer*" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claim 1 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2 of U.S. Patent No. 6881511. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The US patent'511 claims the following (see claims 1-2):

> 1. A metal-air battery comprising a gas diffusion electrode comprising a blocking layer and an active layer, wherein said blocking layer or said active layer, or both comprise at least one modified carbon product and at least one binder, said modified carbon product comprising at least one carbon product having attached at least one organic group.
>
> 2. A fuel cell comprising a gas diffusion electrode comprising a blocking layer and an active layer, wherein said blocking layer or said active layer, or both comprise at least one modified carbon product and at least one binder, said modified carbon product comprising at least one carbon product having attached at least one organic group.

In this case, it is noted that the claims of US patent '511 encompass and at once envisage the use of a modified carbon product in a metal-air battery. Furthermore, it is noted that a metal air battery cell is a type of fuel cell which require also needs to have a reactant fed into the cell.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 3-8, 10, 14 and 17-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu et al 6399202.

The applied reference has a assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

The instant application is drawn to a fuel cell wherein the claimed inventive concept comprises an electrode comprising at least one modified carbon product having specific group

attached thereto. Other limitations include the specific blocking layer and active layer; the binder-free active layer; the specific solid electrolyte membrane; and the specific organic group.

As to claims 1, 17 and 22:

Yu et al disclose gas diffusion electrodes containing modified carbon products wherein the modified carbon product is a carbon product having attached at least one organic group (abstract). It is further disclosed that the Yu et al's invention relates to gas diffusion electrodes such as the ones used in fuel cells and also relates to modified carbon products used to form one or more components of the gas diffusion electrodes (col 3, lines 44-49/ col 3, lines 56-60). It is disclosed that gas diffusion electrodes prepared with modified carbon material have broad applications, one example of a gas diffusion electrode application would be a phosphoric acid type fuel cell using a pair of gas diffusion electrodes or for solid polymer electrolyte fuel cells (col 8, lines 45-50 & line 54). It is noted that Yu et al mentions publications in which they all are incorporated in their entirety by reference (col 8, lines 45-61). In addition, it is mentioned that the present invention can also be used in fuel cells; wherein each of these applications can incorporate the modified carbon material of the present invention in the electrode to obtain the discussed benefits (col 9, lines 3-4 and lines 8-13). *In view of this, it is inherent that a fuel cell should at least comprise two electrodes and an electrolyte to satisfy mechanical, chemical and kinetic requirements (basic components) so as to obtain a fully functional or working fuel cell which converts electrochemical energy into electrical energy.*

Yu et al directly disclose the gas diffusion electrode including the carbon supports therefor (COL 1, lines 5-12/ COL 15, lines 38-43); and in combination with electrocatalyst

particles (COL 1, lines 30-35/ COL 13, lines 15-20/ COL 2, lines 50-65) for the preparation of an active layer material (EXAMPLES 14-15/ COL 12, line 50 to COL 13, line 28).

As previously mentioned, in particular, it is noted that Yu et al in column 2, lines 19-30 and 53-65 incorporates in its entirety by reference the teachings of Dirven et al 5561000 who discloses a gas diffusion electrode for an electrochemical cell with solid electrolyte (ABSTRACT of Dirven et al'000 which is incorporated by reference). It is further disclosed that a fuel cell is mainly composed of the assembly of a cathode, an anode and in between them a solid electrolyte membrane (col 3, lines 7-11 of Dirven et al'000 which is incorporated by reference).

Examiner's note: *it is noted that the limitation "a thickness of about 5 microns or less" does include 0 as a lower limit. Thus, the foregoing limitation also reads on "a layer free" or "a thickness of 0 micron". (See MPEP 2173.05(c) Numeral Ranges & Amounts Limitations, II. Open-Ended Numerical Ranges). Thus, no active layer is required.*

As to claim 3:

It is disclosed that the modified carbon product can be used for at least one component of electrodes such as the active layer and/or the blocking layer (abstract). It is disclosed that with respect to air diffusion electrode which is generally used in fuel cells, this type of electrode generally is constructed to have a blocking layer and an active layer (col 3, lines 62-65).

As to claim 4:

It is disclosed that the blocking layer, the active layer or both contain at least one modified carbon product; thus, it is preferred that the modified carbon product comprise at least one carbon product having attached at least one organic group (col 4, lines 31-47).

As to claims 4, 6, 18-19, 21 and 24-25:

It is disclosed that with respect to the active layer, preferably the active layer contains a modified carbon product wherein the carbon product preferably has attached at least one type if hydrophobic organic group (col 4, line 66 to col 5, line 10). Yu et al also disclose a gas diffusion layer wherein a catalytic layer is formed on a porous back support by mixing catalyst particles of Pt (col 2, lines 50-57); wherein in some cathode structures the solution is made of PT/C catalyst powder (col 2, lines 62-65). It is further noted that Yu et al's teaching refers to a technique disclosed by US patent 5,561,000 which is incorporated in its entirety by reference herein (col 2, lines 19-21 and 50-65). *Thus, Yu et al's teaching fully encompasses the teachings of the '000 patent.*

With respect to claim 5:

It is noted that Yu et al in column 8, lines 38-61 incorporates in its entirety by reference the teachings of Cabasso et al 5783325 who discloses electrolytic gas diffusion electrodes for fuel cells (ABSTRACT of Cabasso et al'325 which is incorporated by reference) wherein the active catalytic layer has a thickness between about 7 Tm and about 50 Tm (col 4, lines 50-56 of Cabasso et al'325 which is incorporated by reference). It is noted that the disclosed thickness range, particularly from 7-10 Tm, falls within the instantly claimed range. *Accordingly, this thickness magnitude provides good performance, provides a gas diffusion electrode with favorable chemical and electrical properties for fuel cells, provides a gas diffusion electrode with a controlled electrode structure, porosity and size making it possible to formulate each structure with properties that are most suitable for its function.*

As to claim 7:

It is disclosed that one preferred advantage of the present invention is the ability to reduce such fluorine containing compounds in the blocking layer or active layer; the proper choice of organic groups attached onto the carbon product to form the modified carbon product can lead to a decrease if not an elimination of fluorine containing compounds (col 7, line 23-35); such fluorine containing compounds typically used are polytetrafluoroethylene and/or perfluoric sulphonic acid polymer (col 7, lines 17-21).

Regarding claim 8:

It is noted that Yu et al in column 2, lines 19-30 and 53-65 incorporates in its entirety by reference the teachings of Dirven et al 5561000 who discloses gas diffusion electrode with catalyst for an electrochemical cell with solid electrolyte (ABSTRACT of Dirven et al'000 which is incorporated by reference) wherein the electrolyte is made of an ion exchange polymer or ionomer such as polytetrafluoroethylene (col 3, lines 32-40 of Dirven et al'000 which is incorporated by reference). It is taught that solid electrolyte membranes are made of an ion exchange polymer or ionomer because such material is very suited (col 3, lines 32-40 of Dirven et al'000 which is incorporated by reference).

As to claim 10:

It is disclosed that said organic group is p-$C_6H_4SO_3^-Na^+$ (claim 9). Thus, this specific ionic organic group comprises the instantly claimed organic group.

As to claim 14:

It is disclosed that the functional groups forming anions are ionizable (col 5, lines 15-16) and it is understood that cationic counter ions can be exchanged to other ions through an ion-exchange process (col 5, lines 42-44). Examples of ionizable functional groups that form cationic

groups are disclosed (col 5, lines 15-40; col 5, line 57 to col 6, line 15). *Thus, it should be recognized that the organic group is either a proton-conducting group or electrode-conducting group.*

Concerning claim 23:

Disclosed is the use of a Co-containing material as a cationic metal catalytic material (COL 13, lines 15-20); as well as Pt (COL 2, lines 50-65).

Thus, the claims are anticipated.

9. Claims 1 and 17 are (*at least*) rejected under 35 U.S.C. 102(e) as being anticipated by Tosco et al 6881511

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Tosco et al disclose gas diffusion electrodes containing modified carbon products wherein the modified carbon product is a carbon product having attached a least one organic group; and can be used for at least one component of the electrodes such as the active layer and/or the blocking layer (ABSTRACT). Tosco et al disclose that their invention relates to gas diffusion electrodes such as the ones in metal-air batteries and fuel cells (COL 3, lines 65-67/ COL 4, lines 15-20/ COL 8, line 65 to COL 9, line 10/ COL 9, lines 22-26). *It is noted that the*

counter-electrode and the electrolyte are fuel cell components which are necessarily presented therein so as to have a functional fuel cell. In view of this, it is inherent that a fuel cell should at least comprise two electrodes and an electrolyte to satisfy mechanical, chemical and kinetic requirements (basic components) so as to obtain a fully functional or working fuel cell which converts electrochemical energy into electrical energy.

Examiner's note: *it is noted that the limitation "a thickness of about 5 microns or less" does include 0 as a lower limit. Thus, the foregoing limitation also reads on "a layer free" or "a thickness of 0 micron". (See MPEP 2173.05(c) Numeral Ranges & Amounts Limitations, II. Open-Ended Numerical Ranges). Thus, no active layer is required.*

Thus, the claims are anticipated.

10. Claims 1 and 17 are (*at least*) rejected under 35 U.S.C. 102(b) as being anticipated by Bolster et al 4835074.

Bolster et al disclose modified carbons and electrochemical cells containing the same (TITLE/CLAIM 1). Specifically, the chemically modified carbon is used as an electrode for energy consuming cells (ABSTRACT) including fuel cells (COL 4, lines 55-65). The modified carbon includes alkyl, alkoxy, aryl, aralkyl in its chemical formula (COL 3, lines 7-30). *Thus, it has attached thereto an organic group.* Disclosed is that the electrochemical cell includes a cathode, an anode and an electrolyte wherein at least one electrode comprises the carbon modified material (COL 3, lines 54-59/CLAIM 1).

Examiner's note: *it is noted that the limitation "a thickness of about 5 microns or less" does include 0 as a lower limit. Thus, the foregoing limitation also reads on "a layer free" or "a*

thickness of 0 micron". (See MPEP 2173.05(c) Numeral Ranges & Amounts Limitations, II. Open-Ended Numerical Ranges). Thus, no active layer is required.

Thus, the claims are anticipated.

11. Claims 1 and 17 are (*at least*) rejected under 35 U.S.C. 102(b) as being anticipated by Oswin 3077508.

Oswin discloses a fuel cell electrode (TITLE) comprising a bi-porous carbon plate having a catalytically activating metal chemically bonded therein, said carbon plate being formed by carbonizing an ion exchange resin containing metal ions upon the surface of a porous compacted carbon plate (CLAIMS 1 and 4) wherein the cation exchange resin contains carboxyl groups (CLAIM 3 and 6). Oswin also discloses the fuel electrode, the air electrode and the electrolyte (COL 1, line 70 to COL 2, line 10). The use of catalytic material in carbon support is also taught (COL 1, lines 15-35),

Examiner's note: *it is noted that the limitation "a thickness of about 5 microns or less" does include 0 as a lower limit. Thus, the foregoing limitation also reads on "a layer free" or "a thickness of 0 micron". (See MPEP 2173.05(c) Numeral Ranges & Amounts Limitations, II. Open-Ended Numerical Ranges). Thus, no active layer is required.*

Thus, the claims are anticipated.

12. Claims 1 and 17 are (*at least*) rejected under 35 U.S.C. 102(b) as being anticipated by Swathirajan et al 5316871.

Swathirajan et al disclose membrane- electrode assemblies for electrochemical cells (TITLE), particularly, fuel cells (COL 1, lines 20-23). It is disclosed that fuel cells include first and second electrodes and a solid polymer electrolyte membrane; each electrode is adhered to a respective one of the first and second membrane surfaces (COL 1, lines 42-50) and each electrodes comprise a respective group of finely divided carbon particles, finely divided catalytic particles supported in internal and external surfaces of the carbon particles and a proton conductive material intermingled with the catalytic and carbon particles (COL 1, lines 51-57). Divulged is that the carbon groups contains carboxylic groups on the carbon surface (*the organic group*) (COL 12, lines 60-65).

Examiner's note: *it is noted that the limitation "a thickness of about 5 microns or less" does include 0 as a lower limit. Thus, the foregoing limitation also reads on "a layer free" or "a thickness of 0 micron". (See MPEP 2173.05(c) Numeral Ranges & Amounts Limitations, II. Open-Ended Numerical Ranges). Thus, no active layer is required.*

Thus, the claims are anticipated.

Response to Arguments

13. Applicant's arguments with respect to the foregoing claims have been considered but are moot in view of the new ground(s) of rejection.

14. Prosecution on the merits of this application has been reopened on the foregoing claims considered unpatentable for the reasons indicated supra.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
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